Some Gogga Documentation

Package it

Interface Summary	
XYValWatcher	Classes which wish to receive notification of where the mouse cursor is in a Graph Panel have to implement this class and provide the illustrated method.

Class Summary	
CirclePoint	This class provides a simple circular point drawing shape for the point markers in a graph.
CrossPoint	This class provides a simple cross '+' point drawing shape for the point markers in a graph.
Gogga	A Gogga object is a unique "insect" that can travel on a grid.
GoggaGrid	The GoggaGrid class provides the Frame in which Gogga objects are displayed.
Graph	This class allows a graph based on a set of points to be graphed.
Graphable	This is a superclass for all graphable objects.
GraphFrame	The GraphFrame class provides an environment for the GraphPanel class.
GraphListener	Support class for when things happen to the GraphPanel class.
GraphPanel	This class represents the actual graph drawing context and its support facilities.
LineGraph	This class allows a simple line function to be graphed.
NoPoint	This class provides a drawing shape in which no shape is drawn for the point markers in a graph.
PointShape	This abstract class is the super-class for all point markers for a graph.
SquarePoint	This class provides a simple square point drawing shape for the point markers in a graph.
TrianglePoint	This class provides a simple triangle point drawing shape for the point markers in a graph.
TrigGraph	This class allows a simple trig function to be graphed over a given range.

it

Class GoggaGrid

```
java.lang.Object
  |
  +--java.awt.Component
        |
        +--java.awt.Container
              |
              +--java.awt.Window
                    |
                    +--java.awt.Frame
                          |
                          +--it.GoggaGrid
```

All Implemented Interfaces:

javax.accessibility.Accessible, java.awt.event.ActionListener, java.awt.event.AdjustmentListener, java.util.EventListener, java.awt.image.ImageObserver, java.awt.MenuContainer, java.io.Serializable

---

public class **GoggaGrid**
extends java.awt.Frame
implements java.awt.event.ActionListener, java.awt.event.AdjustmentListener

The `GoggaGrid` class provides the Frame in which Gogga objects are displayed. A single static `GoggaGrid` object is automatically created for all Gogga objects. Class users should not use this class directly.

See Also:

Serialized Form

Inner classes inherited from class java.awt.Frame
`java.awt.Frame.AccessibleAWTFrame`

Inner classes inherited from class java.awt.Window
`java.awt.Window.AccessibleAWTWindow`

Inner classes inherited from class java.awt.Container
`java.awt.Container.AccessibleAWTContainer`

Inner classes inherited from class java.awt.Component
`java.awt.Component.AccessibleAWTComponent`

Fields inherited from class java.awt.Frame
`CROSSHAIR_CURSOR, DEFAULT_CURSOR, E_RESIZE_CURSOR, HAND_CURSOR, ICONIFIED, MOVE_CURSOR, N_RESIZE_CURSOR, NE_RESIZE_CURSOR, NORMAL, NW_RESIZE_CURSOR, S_RESIZE_CURSOR, SE_RESIZE_CURSOR, SW_RESIZE_CURSOR, TEXT_CURSOR, W_RESIZE_CURSOR, WAIT_CURSOR`

Fields inherited from class java.awt.Component
`BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT`

Fields inherited from interface java.awt.image.ImageObserver
ABORT, ALLBITS, ERROR, FRAMEBITS, HEIGHT, PROPERTIES, SOMEBITS, WIDTH

Constructor Summary

GoggaGrid()
GoggaGrid(int newXSize, int newYSize)

Method Summary

void	actionPerformed(java.awt.event.ActionEvent evt)
void	adjustmentValueChanged(java.awt.event.AdjustmentEvent evt)
void	drawGoggaTrail(int x1, int y1, int x2, int y2, java.awt.Color color, int trailWidth)
int	getXSize()
int	getYSize()
void	hideGogga(int xPos, int yPos, int direction, java.awt.Color color, java.lang.String label)
void	showGogga(int xPos, int yPos, int direction, java.awt.Color color, java.lang.String label)

Methods inherited from class java.awt.Frame
addNotify, finalize, getAccessibleContext, getCursorType, getFrames, getIconImage, getMenuBar, getState, getTitle, isResizable, paramString, remove, removeNotify, setCursor, setIconImage, setMenuBar, setResizable, setState, setTitle

Methods inherited from class java.awt.Window
addWindowListener, applyResourceBundle, applyResourceBundle, dispose, getFocusOwner, getGraphicsConfiguration, getInputContext, getListeners, getLocale, getOwnedWindows, getOwner, getToolkit, getWarningString, hide, isShowing, pack, postEvent, processEvent, processWindowEvent, removeWindowListener, setCursor, show, toBack, toFront

Methods inherited from class java.awt.Container
add, add, add, add, add, addContainerListener, addImpl, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getInsets, getLayout, getMaximumSize, getMinimumSize, getPreferredSize, insets, invalidate, isAncestorOf, layout, list, list, locate, minimumSize, paint, paintComponents, preferredSize, print, printComponents, processContainerEvent, remove, remove, removeAll, removeContainerListener, setFont, setLayout, update, validate, validateTree

Methods inherited from class java.awt.Component
action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addPropertyChangeListener, addPropertyChangeListener, bounds,

checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, disable, disableEvents, dispatchEvent, enable, enable, enableEvents, enableInputMethods, firePropertyChange, getBackground, getBounds, getBounds, getColorModel, getComponentOrientation, getCursor, getDropTarget, getFont, getFontMetrics, getForeground, getGraphics, getHeight, getInputMethodRequests, getLocation, getLocation, getLocationOnScreen, getName, getParent, getPeer, getSize, getSize, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, imageUpdate, inside, isDisplayable, isDoubleBuffered, isEnabled, isFocusTraversable, isLightweight, isOpaque, isValid, isVisible, keyDown, keyUp, list, list, list, location, lostFocus, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paintAll, prepareImage, prepareImage, printAll, processComponentEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setDropTarget, setEnabled, setForeground, setLocale, setLocation, setLocation, setName, setSize, setSize, setVisible, show, size, toString, transferFocus

Methods inherited from class java.lang.Object

clone, equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

Methods inherited from interface java.awt.MenuContainer

getFont, postEvent

Constructor Detail

GoggaGrid

```
public GoggaGrid()
```

GoggaGrid

```
public GoggaGrid(int newXSize,
                 int newYSize)
```

Method Detail

getXSize

```
public int getXSize()
```

---

getYSize

```
public int getYSize()
```

---

drawGoggaTrail

```
public void drawGoggaTrail(int x1,
                           int y1,
                           int x2,
                           int y2,
```

```
                    java.awt.Color color,
                    int trailWidth)
```

---

hideGogga

```
public void hideGogga(int xPos,
                      int yPos,
                      int direction,
                      java.awt.Color color,
                      java.lang.String label)
```

---

showGogga

```
public void showGogga(int xPos,
                      int yPos,
                      int direction,
                      java.awt.Color color,
                      java.lang.String label)
```

---

actionPerformed

```
public void actionPerformed(java.awt.event.ActionEvent evt)
```

Specified by:

actionPerformed in interface java.awt.event.ActionListener

---

adjustmentValueChanged

```
public void adjustmentValueChanged(java.awt.event.AdjustmentEvent evt)
```

Specified by:

adjustmentValueChanged in interface java.awt.event.AdjustmentListener

---

Class Gogga

java.lang.Object
  extended by Gogga

public class Gogga
extends java.lang.Object

A Gogga object is a unique "insect" that can travel on a grid. A Gogga has its starting position near the centre of the grid, facing up. It draws a trail when it moves. The trail has a default color of red, and a default width of 8. A Gogga can perform various actions such as move, turn right, turn left, move to a set position, return its current position, hide or show its trail. It can also have a label to identify it.

Field Summary

java.awt.Color	color The colour of the Gogga and its trail, eg.
int	direction An integer value giving the direction in which the Gogga is facing.
static int	DOWN The DOWN direction specified by the integer 2
java.lang.String	label A String or name identifying a Gogga object.
static int	LEFT The LEFT direction specified by the integer 3
static int	RIGHT The RIGHT direction specified by the integer 4
boolean	trailVisible Either true or false, specifying whether or not the trail is visible.
int	trailWidth An integer value giving the width or size of the trail drawn by a Gogga The default starting width is 5.
static int	UP The UP direction specified by the integer 1
int	xPos An integer x-coordinate giving the Gogga's horizontal position on the grid.
int	yPos An integer y-coordinate giving the Gogga's vertical position on the grid.

Constructor Summary

Gogga() Constructor to use default starting values
Gogga(java.awt.Color color) Constructor to set starting colour.

Gogga(int startX, int startY) Constructor to set starting x and y positions.
Gogga(int startX, int startY, java.awt.Color color) Constructor to set starting x and y positions, and starting colour.
Gogga(int startX, int startY, int startDirection, java.awt.Color startColor) Constructor to set starting x and y positions, direction, and colour

Method Summary

int	**getDirection**() Gets the current direction of the Gogga object.
int	**getXPos**() Gets the x position of the Gogga object.
int	**getYPos**() Gets the y position of the Gogga object.
void	**move**() Moves the Gogga object one unit on the grid.
void	**setColor**(java.awt.Color newColor) Sets the colour of the Gogga object.
void	**setDirection**(int newDirection) Sets the direction of the Gogga object.
static void	**setGridSize**(int newXSize, int newYSize) Specifies the starting size of the grid that Gogga objects will use.
void	**setLabel**(java.lang.String newLabel) Sets the label of the Gogga object.
void	**setPosition**(int newX, int newY) Sets the x and y positions of the Gogga object.
void	**setTrailWidth**(int newTrailWidth) Sets the width of the trail of the Gogga object.
void	**trailOff**() Turns off the trail of the Gogga object.
void	**trailOn**() Turns on the trail of the Gogga object.
void	**turnLeft**() Turns the Gogga object left by 90 degrees.
void	**turnRight**() Turns the Gogga object right by 90 degrees.

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

UP

```
public static final int UP
```

The UP direction specified by the integer 1

See Also:
Constant Field Values

DOWN

```
public static final int DOWN
```

The DOWN direction specified by the integer 2

See Also:
Constant Field Values

LEFT

```
public static final int LEFT
```

The LEFT direction specified by the integer 3

See Also:
Constant Field Values

RIGHT

```
public static final int RIGHT
```

The RIGHT direction specified by the integer 4

See Also:
Constant Field Values

---

xPos

```
public int xPos
```

An integer x-coordinate giving the Gogga's horizontal position on the grid. The default starting value is x = 7.

---

yPos

```
public int yPos
```

An integer y-coordinate giving the Gogga's vertical position on the grid. The default starting value is y = 5.

---

direction

```
public int direction
```

An integer value giving the direction in which the Gogga is facing. 1 - UP, 2 - DOWN, 3 - LEFT, 4 - RIGHT The default starting value is 1 - UP.

color

```
public java.awt.Color color
```

The colour of the Gogga and its trail, eg. Color.red (red is the default colour). The colours are those specified by the Color class, which is part of the java.awt package, which must be imported every time a new Color object is created.

---

trailWidth

```
public int trailWidth
```

An integer value giving the width or size of the trail drawn by a Gogga The default starting width is 5.

---

trailVisible

```
public boolean trailVisible
```

Either true or false, specifying whether or not the trail is visible. The default starting value is true, which means that a Gogga object will leave a trail when it moves.

---

label

```
public java.lang.String label
```

A String or name identifying a Gogga object. The default starting value is "" - no label.

Constructor Detail

Gogga

```
public Gogga(int startX,
             int startY,
             int startDirection,
             java.awt.Color startColor)
```

Constructor to set starting x and y positions, direction, and colour

Parameters:

`startX` - The starting x position
`startY` - The starting y position
`startDirection` - The starting direction
`startColor` - The starting colour

Gogga

```
public Gogga()
```

Constructor to use default starting values

Gogga

```
public Gogga(int startX,
             int startY)
```

Constructor to set starting x and y positions. It uses default starting values for other fields.

Gogga

```
public Gogga(java.awt.Color color)
```

Constructor to set starting colour. It uses default starting values for other fields.

Gogga

```
public Gogga(int startX,
             int startY,
             java.awt.Color color)
```

Constructor to set starting x and y positions, and starting colour. It uses default starting values for other fields.

Method Detail

move

```
public void move()
```

Moves the Gogga object one unit on the grid.

---

turnRight

```
public void turnRight()
```

Turns the Gogga object right by 90 degrees.

---

turnLeft

```
public void turnLeft()
```

Turns the Gogga object left by 90 degrees.

---

getXPos

```
public int getXPos()
```

Gets the x position of the Gogga object.

Returns:
the integer representing the horizontal position on the grid.

---

getYPos

```
public int getYPos()
```

Gets the y position of the Gogga object.

Returns:
the integer representing the vertical position on the grid.

---

getDirection

```
public int getDirection()
```

Gets the current direction of the Gogga object.

Returns:
the integer representing the direction in which the Gogga object currently faces.

---

setPosition

```
public void setPosition(int newX,
                        int newY)
```

Sets the x and y positions of the Gogga object. The default starting position is at (7,5).

Parameters:
`newX` - the integer representing the horizontal position on the grid.
`newY` - the integer representing the vertical position on the grid.

---

setDirection

```
public void setDirection(int newDirection)
```

Sets the direction of the Gogga object.

Parameters:
`newDirection` - An integer representing the direction (1 - UP, 2 - DOWN, 3 - LEFT, 4 - RIGHT)

---

setColor

```
public void setColor(java.awt.Color newColor)
```

Sets the colour of the Gogga object.

Parameters:
`newColor` - The colour must be specified using the colours given in the Color class of the java.awt package.

---

setTrailWidth

```
public void setTrailWidth(int newTrailWidth)
```

Sets the width of the trail of the Gogga object.

Parameters:
`newTrailWidth` - An integer specifying how wide the trail will be. The default width is 5.

setLabel

```
public void setLabel(java.lang.String newLabel)
```

Sets the label of the Gogga object.

Parameters:

`newLabel` - Enables the Gogga object to be identified.

---

trailOn

```
public void trailOn()
```

Turns on the trail of the Gogga object.

---

trailOff

```
public void trailOff()
```

Turns off the trail of the Gogga object.

---

setGridSize

```
public static void setGridSize(int newXSize,
                               int newYSize)
```

Specifies the starting size of the grid that Gogga objects will use.

Parameters:

`newXSize` - The number of columns across. Maximum is 31.
`newYSize` - The number of rows down. Maximum is 19.

A

ACOS - Static variable in class it.TrigGraph

actionPerformed(ActionEvent) - Method in class it.GoggaGrid

addGraph(Graphable) - Method in class it.GraphFrame
Convenience method that calls the addGraph method in GraphPanel.
addGraph(Graphable) - Method in class it.GraphPanel
Add a graphable object to the container of graphs to be drawn.
addGraphListener(XYValWatcher) - Method in class it.GraphPanel
Adds a listener for mousetype motion events to the panel.
addPoint(double, double) - Method in class it.Graph
Creates a Point2D.double object with the specified values and adds it to the end of the points to be drawn.
addPoint(Point2D.Double) - Method in class it.Graph
Adds a 2d point to the end of the points to be drawn.
adjustmentValueChanged(AdjustmentEvent) - Method in class it.GoggaGrid

ASIN - Static variable in class it.TrigGraph

ATAN - Static variable in class it.TrigGraph

B

backgroundColour - Variable in class it.GraphPanel
Holder for the background colour.
BORDER - Variable in class it.GraphPanel
Pre-defined colour of light-lilac (the swing 0xEEEEFF)
borderColour - Variable in class it.GraphPanel
Holder for the border colour.

C

CIRCLE - Static variable in class it.PointShape

CirclePoint - class it.CirclePoint.
This class provides a simple circular point drawing shape for the point markers in a graph.
CirclePoint(byte) - Constructor for class it.CirclePoint
Define a circular point either FILLED or UNFILLED.
CONTINUOUS - Static variable in class it.Graphable
Continuous line drawing - ie point-to-point.
coords - Variable in class it.Graph

COS - Static variable in class it.TrigGraph

CROSS - Static variable in class it.PointShape

CrossPoint - class it.CrossPoint.
This class provides a simple cross '+' point drawing shape for the point markers in a graph.
CrossPoint() - Constructor for class it.CrossPoint

CrossPoint(byte) - Constructor for class it.CrossPoint

D

deleteAllGraphs() - Method in class it.GraphFrame
Calls GraphPanel's deleteAllGraphs() to delete all the graphs currently displayed on the GraphPanel.
deleteAllGraphs() - Method in class it.GraphPanel
Remove all the graphs from the container of graphs to be drawn.
DOWN - Static variable in class it.Gogga
The DOWN direction
drawGoggaTrail(int, int, int, int, Color, int) - Method in class it.GoggaGrid

drawGraph(Graphics, GraphPanel) - Method in class it.Graphable
This method handles the drawing of the graph to the GraphPanel canvas.
drawGraph(Graphics, GraphPanel) - Method in class it.Graph
This method is overriding the superclass method.
drawingStyle - Variable in class it.Graphable
Placeholder for how to draw the graph - ie either CONTINUOUS or PLOTPOINTS.
drawPoint(Graphics, int, int) - Method in class it.PointShape
All sub-classes **must** supply a drawPoint method so that the point can be drawn to the canvas at location (x,y).
drawPoint(Graphics, int, int) - Method in class it.TrianglePoint
Draws a triangle marker of width and height with centre at (x,y)
drawPoint(Graphics, int, int) - Method in class it.CrossPoint
Draws a cross marker bounded by width and height with centre at (x,y)
drawPoint(Graphics, int, int) - Method in class it.SquarePoint
Draws a square marker of width and height with centre at (x,y)
drawPoint(Graphics, int, int) - Method in class it.NoPoint
Draws a no point marker of width and height with centre at (x,y)
drawPoint(Graphics, int, int) - Method in class it.CirclePoint
Draws a circular marker of width and height with centre at (x,y)
drawPoints - Variable in class it.Graph

drawTitle - Variable in class it.Graphable
TRUE if graph is to draw the title, false if not.

E

evaluateXY(Point2D.Double) - Method in class it.TrigGraph
Evaluate f(x) for the trig graph.
evaluateXY(Point2D.Double) - Method in class it.LineGraph
Evaluate f(x) = mx + c.
evaluateXY(Point2D.Double) - Method in class it.Graph
As this is the most generic and special instance of a graphable object with the points to be plotted held in a container, this evaluation method is somewhat redundant as no longer is the function f(x) being evaluated for a particular x - rather 2d points are plotted and the work done in the overrided drawGraph method.
EXPONENTIAL - Static variable in class it.Graphable

F

FILLED - Static variable in class it.PointShape

G

getAxisValues() - Method in class it.GraphFrame
Returns the axis values as an array of doubles: xMin, xMax, yMin, yMax respectively.
getAxisValues() - Method in class it.Graphable
Returns the axis values as an array of doubles: xMin, xMax, yMin, yMax respectively.
getAxisValues() - Method in class it.GraphPanel
Method that returns the minimum and maximum x and y axis values in an array of doubles: xMin, xMax, yMin and yMax respectively.
getDirection() - Method in class it.Gogga
Gets the current direction of the Gogga object.
getGraphs() - Method in class it.GraphFrame
Gets an enumeration of the graphs in the GraphPanel object.
getGraphs() - Method in class it.GraphPanel

getNewLabel(String, byte) - Method in class it.GraphFrame
This method shows a dialog that prompts the user for a new label of an axis.
getNewValue(String, byte) - Method in class it.GraphFrame
This method shows a dialog that prompts the user for a value for the new extremis of an axis.
getXPos() - Method in class it.Gogga
Gets the x position of the Gogga object.
getXSize() - Method in class it.GoggaGrid

getYPos() - Method in class it.Gogga
Gets the y position of the Gogga object.
getYSize() - Method in class it.GoggaGrid

Gogga - class it.Gogga.
A `Gogga` object is a unique "insect" that can travel on a grid.
Gogga() - Constructor for class it.Gogga
Constructor to use default starting values (with Gogga near the centre of the grid, facing upwards and a red trail colour)
Gogga(Color) - Constructor for class it.Gogga
Constructor to set starting colour.
Gogga(int, int) - Constructor for class it.Gogga
Constructor to set starting x and y positions.
Gogga(int, int, Color) - Constructor for class it.Gogga
Constructor to set starting x and y positions, and starting colour.
Gogga(int, int, int, Color) - Constructor for class it.Gogga
Constructor to set starting x and y positions, direction, and colour
GoggaGrid - class it.GoggaGrid.
The `GoggaGrid` class provides the Frame in which Gogga objects are displayed.
GoggaGrid() - Constructor for class it.GoggaGrid

GoggaGrid(int, int) - Constructor for class it.GoggaGrid

gradient - Variable in class it.LineGraph

value for m in f(x) = mx + c

Graph - class it.Graph.
This class allows a graph based on a set of points to be graphed.

Graph() - Constructor for class it.Graph
Creates an empty PointGraph with default point marker as being a NoPoint.

Graph(double[][]) - Constructor for class it.Graph
Creates a new PointGraph object and sets the points contained within to the values in the double array and with default point marker as being a cross.

Graphable - class it.Graphable.
This is a superclass for all graphable objects.

graphColor - Variable in class it.Graphable
The colour used to draw the graph.

grapher - Static variable in class it.Graphable
The object to which all graphs are added

GraphFrame - class it.GraphFrame.
The GraphFrame class provides an environment for the GraphPanel class.

GraphFrame() - Constructor for class it.GraphFrame
This constructor is responsible for setting up the window properties and will build the menus for the demo.

GraphListener - class it.GraphListener.
Support class for when things happen to the GraphPanel class.

GraphListener(GraphPanel, XYValWatcher) - Constructor for class it.GraphListener

graphPanel - Variable in class it.GraphFrame
The graphing context that will be drawn.

GraphPanel - class it.GraphPanel.
This class represents the actual graph drawing context and its support facilities.

GraphPanel(JFrame) - Constructor for class it.GraphPanel
The only constructor available takes a JFrame for the controller and defaults several of the fields.

H

height - Variable in class it.PointShape

height - Variable in class it.GraphPanel
The dimension of this panel

hideGogga(int, int, int, Color, String) - Method in class it.GoggaGrid

---

I

intercept - Variable in class it.LineGraph
value for c in f(x) = mx + c

it - package it

L

LEFT - Static variable in class it.Gogga
The LEFT direction

LINEAR - Static variable in class it.Graphable

LineGraph - class it.LineGraph.
This class allows a simple line function to be graphed.
LineGraph() - Constructor for class it.LineGraph
Default constructor.
LineGraph(double, double) - Constructor for class it.LineGraph
Constructor that takes a value for m and c and sets accordingly

---

M

mainType - Variable in class it.Graphable
Placeholder for kind of graph.
mouseMoved(MouseEvent) - Method in class it.GraphListener
Listen for mouse moved event
move() - Method in class it.Gogga
Moves the Gogga object one unit on the grid in the direction in which it is facing.

N

NaN - Variable in class it.Graphable
NaN holds whether a not-a-number event occurred.
NONE - Static variable in class it.PointShape

NoPoint - class it.NoPoint.
This class provides a drawing shape in which no shape is drawn for the point markers in a graph.
NoPoint() - Constructor for class it.NoPoint

NUMPOINTS - Static variable in class it.TrianglePoint

numTicks - Variable in class it.GraphPanel
For the number of tick marks on the axis.

O

OFFSETX - Static variable in class it.GraphPanel
X boundary dimension.
OFFSETY - Static variable in class it.GraphPanel
Y boundary dimension.

P

p - Variable in class it.Graphable
Co-ordinate that holds the (x,y) in graph-space.
paint(Graphics) - Method in class it.GraphPanel
This method handles the drawing of the graph panel.
PARABOLA - Static variable in class it.Graphable

PLOTPOINTS - Static variable in class it.Graphable
Discontinuous line drawing - ie just the points.
POINT - Static variable in class it.Graphable

points - Variable in class it.Graph

PointShape - class it.PointShape.
This abstract class is the super-class for all point markers for a graph.
pushChanges() - Method in class it.GraphFrame
Called from Graphable or any of its subclasses in response to any change in graph information.

R

removeGraph() - Method in class it.Graphable

removeGraph(Graphable) - Method in class it.GraphFrame
Convenience method that calls the removeGraph method in GraphPanel.
removeGraph(Graphable) - Method in class it.GraphPanel
Remove a graphable object from the container of graphs to be drawn.
replaceElements(double[][]) - Method in class it.Graph
Replace all elements in graph with the new set of points.
RIGHT - Static variable in class it.Gogga
The RIGHT direction

S

setAmplitude(double) - Method in class it.TrigGraph
This method modifies the amplitude of the graph
setAxes(double, double, double, double) - Method in class it.GraphFrame
Changes the axes of the graph frame.
setAxes(double, double, double, double) - Method in class it.Graphable
Sets the axes of the graph to be selected values
setAxisLabel(String, byte) - Method in class it.GraphPanel
Method that sets the appropriate axis label (determined by the given byte whichAxis) to the given string.
setAxisLabels(String, String) - Method in class it.GraphFrame
Sets the axis labels to the given strings.
setAxisLabels(String, String) - Method in class it.Graphable
Sets the axis labels to the given Strings.
setAxisValue(double, byte) - Method in class it.GraphPanel
This method takes a double value and sets the corresponding axis parameter if it makes sense.
setAxisValue(double, double, double, double) - Method in class it.GraphPanel
This method takes a 4-tuple of values for the axis values and sets accordingly if they make sense.
setBackgroundColour(Color) - Method in class it.GraphPanel
Sets the colour of the background that the graph is drawn on.
setBorderColour(Color) - Method in class it.GraphPanel
Sets the colour of the border that surrounds the graph.
setColor(Color) - Method in class it.Graphable
Sets the colour of the graph.
setColor(Color) - Method in class it.Gogga
Sets the colour of the Gogga object.
setDirection(int) - Method in class it.Gogga
Sets the direction of the Gogga object.
setDrawingStyle(byte) - Method in class it.Graphable
Sets the style of how the graph is drawn.
setDrawingStyle(byte) - Method in class it.Graph
Sets the style of how the graph is drawn.
setDrawPoints(boolean) - Method in class it.Graph
Set whether to draw the points or not

setDrawShape(boolean) - Method in class it.Graph
Set whether to draw the point markers or not.
setDrawTitle(boolean) - Method in class it.Graphable
Set true if graph is to draw the title given to it.
setGradient(double) - Method in class it.LineGraph
Sets the gradient.
setGridSize(int, int) - Static method in class it.Gogga
Specifies the starting size of the grid that Gogga objects will use.
setIntercept(double) - Method in class it.LineGraph
Sets the intercept.
setLabel(String) - Method in class it.Gogga
Sets the label of the Gogga object (a string displayed next to the Gogga object on the Gogga Grid).
setLinearParams(double, double) - Method in class it.LineGraph
Sets both m and c accordingly
setPeriod(double) - Method in class it.TrigGraph
This method modifies the period of the graph
setPhase(double) - Method in class it.TrigGraph
This method modifies the phase of the graph
setPointShape(byte) - Method in class it.Graph
Set the shape as described.
setPointShape(PointShape) - Method in class it.Graph
Set the shape that is to be drawn as each point marker.
setPosition(int, int) - Method in class it.Gogga
Sets the x and y positions of the Gogga object.
setShowAxisLabels(boolean) - Method in class it.GraphPanel
Method that sets the boolean showAxisLabels to the given boolean b
setSize(int, int) - Method in class it.PointShape
The bounding box dimensions of the point can be specified here.
setStyle(byte) - Method in class it.PointShape
The style of either FILLED or UNFILLED can be set with this method.
setTitle(String) - Method in class it.Graphable
Sets the title of the graph
setTrailWidth(int) - Method in class it.Gogga
Sets the width of the trail of the Gogga object.
setTrigParams(double, double, double) - Method in class it.TrigGraph
This method modifies the amplitude, period and phase of the graph
shape - Variable in class it.Graph

showAxisLabels - Variable in class it.GraphPanel
Boolean indicating whether axis labels should be displayed; defaults to true.
showGogga(int, int, int, Color, String) - Method in class it.GoggaGrid

SIN - Static variable in class it.TrigGraph

sizeOK - Variable in class it.GraphPanel
Flag for whether the dimensions are too small to adequately draw.
SQUARE - Static variable in class it.PointShape

SquarePoint - class it.SquarePoint.
This class provides a simple square point drawing shape for the point markers in a graph.
SquarePoint(byte) - Constructor for class it.SquarePoint
Define a square point either FILLED or UNFILLED.
statusBar - Variable in class it.GraphFrame
A status bar for the bottom of the frame.
statusBarMessage - Variable in class it.GraphFrame
Message fields for the status bar
style - Variable in class it.PointShape

T

TAN - Static variable in class it.TrigGraph

theGraphs - Variable in class it.GraphPanel
The graphs to be drawn on this context.
title - Variable in class it.Graphable
The title of the graph
trailOff() - Method in class it.Gogga
Turns off the trail of the Gogga object, so that a line is not drawn when the Gogga moves.
trailOn() - Method in class it.Gogga
Turns on the trail of the Gogga object, so that a line is drawn when the Gogga moves.
TRIANGLE - Static variable in class it.PointShape

TrianglePoint - class it.TrianglePoint.
This class provides a simple triangle point drawing shape for the point markers in a graph.
TrianglePoint() - Constructor for class it.TrianglePoint
Creates a triangle point of default configuration of filled, and size 10x10 pixels.
TrianglePoint(byte) - Constructor for class it.TrianglePoint
Define a triangle point either FILLED or UNFILLED.
TRIG - Static variable in class it.Graphable

TrigGraph - class it.TrigGraph.
This class allows a simple trig function to be graphed over a given range.
TrigGraph(byte) - Constructor for class it.TrigGraph
Constructor taking in the type of the trig graph to be created
TrigGraph(byte, double, double, double) - Constructor for class it.TrigGraph
Constructor taking in the type, amplitude, period and phase of the trig graph to be created
turnLeft() - Method in class it.Gogga
Turns the Gogga object left by 90 degrees.
turnRight() - Method in class it.Gogga
Turns the Gogga object right by 90 degrees.

U

UNFILLED - Static variable in class it.PointShape

UP - Static variable in class it.Gogga
The UP direction
updateStatusBar(String) - Method in class it.GraphFrame
Called by the graph panel to update information for the user on events such as resize etc.
updateXYVals(String, String) - Method in class it.GraphFrame
The right hand side of the status bar displays the mouse coordinate values in *graph space* and not in screen coordinate space.
updateXYVals(String, String) - Method in interface it.XYValWatcher
The method called by the GraphListener class.
userSetAxes - Variable in class it.Graphable
A flag to check if user has selected axes or not.

W

width - Variable in class it.PointShape

width - Variable in class it.GraphPanel
The dimension of this panel

X

X - Static variable in class it.Graph

xAxisLabel - Variable in class it.GraphPanel
X axis label; defaults to "X".
XAXISLABEL - Static variable in class it.GraphPanel

xFullScale - Variable in class it.GraphPanel
Variables used in the graph specifics of dimensioning axes and working out bounds.
xMax - Variable in class it.GraphPanel
Maximum for the x axis.
XMAX - Static variable in class it.GraphPanel

xMin - Variable in class it.GraphPanel
Mininum for the x axis.
XMIN - Static variable in class it.GraphPanel

xPixelIncrement - Variable in class it.GraphPanel
Variables used in the graph specifics of dimensioning axes and working out bounds.
xyVal - Variable in class it.GraphFrame
Message fields for the status bar
XYValWatcher - interface it.XYValWatcher.
Classes which wish to receive notification of where the mouse cursor is in a Graph Panel have to implement this class and provide the illustrated method.

Y

Y - Static variable in class it.Graph

yAxisLabel - Variable in class it.GraphPanel
Y axis label; defaults to "Y".
YAXISLABEL - Static variable in class it.GraphPanel

yFullScale - Variable in class it.GraphPanel
Variables used in the graph specifics of dimensioning axes and working out bounds.
yMax - Variable in class it.GraphPanel
Maximum for the y axis.
YMAX - Static variable in class it.GraphPanel

yMin - Variable in class it.GraphPanel
Mininum for the y axis.
YMIN - Static variable in class it.GraphPanel

yPixelIncrement - Variable in class it.GraphPanel
Variables used in the graph specifics of dimensioning axes and working out bounds.

Colors in Java

For tthe first cits1001 project you can use the built in Java colours which are defined in java.awt.Color. Here are a few examples. Look up the rest in the Java library documentation.

```
import java.awt.Color

Pen pen = new Pen();
pen.setColor( Color.RED );
pen.setColor( Color.GREEN );
pen.setColor( Color.BLUE);
pen.setColor( Color.BLACK );
```

However, you may wish to create some more colours. You can do this using the RGB constructor, as shown below. Or if interested, you may also wish to research other colour models such as HSBColor.

Here is a selection of useful RGB colours.

Create a new colour by diving its red, green, blue components:

```
import java.awt.Color;
public static final Color VERY_LIGHT_RED = new Color(255,102,102);
```

NB ← big.setColor(VERY_LIGHT_RED);

Color	RGB Value	Swatch
Very light red	255-102-102	
Light red	255- 51- 51	
Red	255- 0 - 0	
Dark red	204- 0 - 0	
Very dark red	153- 0 - 0	
Very light blue	51-204-255	
Light blue	51-153-255	
Blue	0 - 0 -255	
Dark blue	0 - 0 -204	
Very dark blue	0 - 0 -153	

Very light green	102-255-102
Light green	0 -255- 51
Green	0 -204- 0
Dark green	0 -153- 0
Very dark green	0 -102- 0
Very light yellow	255-255-204
Light yellow	255-255-153
Yellow	255-255- 0
Dark yellow	255-204- 0
Light orange	255-153- 0
Orange	255-102- 0
Gold	255-204- 51
Light grey	204-204-204
Grey	153-153-153
Dark grey	102-102-102
Very dark grey	51- 51- 51
Light brown	153-102- 0

Brown	102- 51- 0
Dark brown	51- 0 - 0
Purple	102- 0 -153
Black	0 - 0 - 0
White	255-255-255